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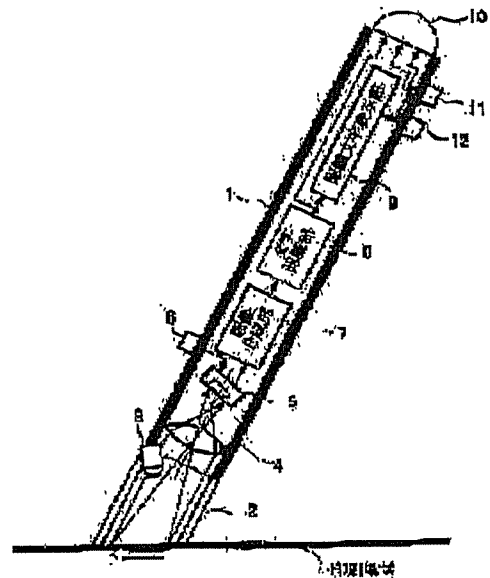
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(54) MANUAL SCANNING TYPE SCANNER

(57)Abstract:

PROBLEM TO BE SOLVED: To enhance the degree of freedom in the scanning direction of a manual scanning type scanner, to make it possible also to scan information displayed on a separated position, and to improve the convenience of operation.

SOLUTION: A character string displayed on a printed matter observed from the aperture end of a transparent part 2, is manually scanned, successively fetched in a prescribed scanning area unit by a two-dimensional image sensor 5 through an optical system lens 4 and supplied to an image compositing part 7. The image compositing part 7 composites the images of respective scanning areas by comparing vertical line images and supplies the composited image to a character recognition part 8 which recognizes the composited image and transmits its corresponding character code to a recognized character display part 9 and an infrared transmission part 10. Thereby, the scanned character string is displayed on the display part 9 and when a switch 11 is depressed, character codes corresponding to the character string are transmitted from the transmission part 10. When a switch 12 is depressed, these character codes are cleared.



PATENT ABSTRACTS OF JAPAN

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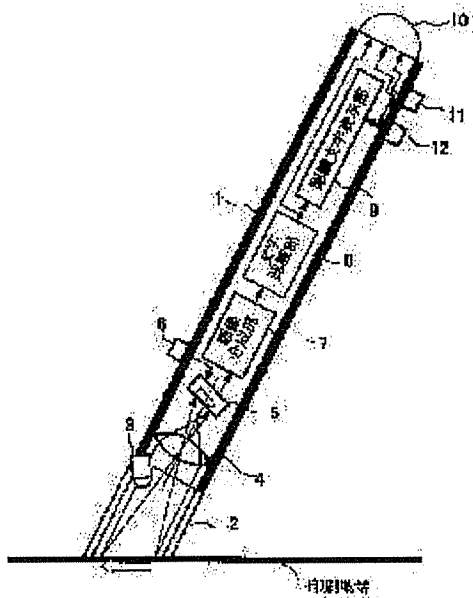
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comparing vertical line images and supplies the composited image to a character recognition part 8 which recognizes the composited image and transmits its corresponding character code to a recognized character display part 9 and an infrared transmission part 10. Thereby, the scanned character string is displayed on the display part 9 and when a switch 11 is depressed, character codes corresponding to the character string are transmitted from the transmission part 10. When a switch 12 is depressed, these character

CLAIMS

[Claim(s)]

[Claim 1] In the hand scanning scanner which reads the information displayed on the body by manual scan The image taking-in means incorporated one by one per predetermined two-dimensional field moved to a manual scan with the two-dimensional image which follows an objective hand scanning direction, An image composition means to compound each image of said two-dimensional field captured by said image taking-in means, and to reproduce said two-dimensional image of the range which carried out the manual scan, The hand scanning scanner characterized by having a transmitting means to

transmit the information according to the playback image compounded by said image composition means to the exterior.

[Claim 2] It is the hand scanning scanner characterized by capturing two or more Rhine images which said image taking-in means left to said hand scanning direction as an image of said two-dimensional field in the hand scanning scanner according to claim 1.

[Claim 3] It is the hand scanning scanner which said image composition means compares the Rhine image perpendicular to the hand scanning direction of each of said incorporated images in a hand scanning scanner according to claim 1 or 2, and is characterized by carrying out sequential junction of the image part newly incorporated by migration of said two-dimensional field, and compounding said playback image based on the location of the Rhine image in agreement.

[Claim 4] The hand scanning scanner characterized by having further the 1st operation means which calculates the movement magnitude of said two-dimensional field based on the location of said Rhine in agreement in a hand scanning scanner according to claim 3.

[Claim 5] It is the hand scanning scanner which recognizes said playback image, has further a recognition means to generate the predetermined code information corresponding to said playback image, in a hand scanning scanner given [of claims 1-4 / one] in a term, and is characterized by said transmitting means transmitting the code information generated with said recognition means.

[Claim 6] It is the hand scanning scanner which has further a display means to display said playback image, and the 1st directions means which directs informational transmission in a hand scanning scanner given [of claims 1-5 / one] in a term, and is characterized by said transmitting means performing transmission when directions are received from said 1st directions means.

[Claim 7] It is the hand scanning scanner which it has further the 2nd

directions means which directs informational un-transmitting in a hand scanning scanner according to claim 6, said display means clears an image on display when directions are received from said 2nd directions means, and is characterized by for said transmitting means to cancel the information which should be transmitted when directions are received from said 2nd directions means.

[Claim 8] It is the hand scanning scanner which has further the 3rd directions means which directs taking in of said two-dimensional image in a hand scanning scanner given [of claims 1-7 / one] in a term, and is characterized by said image taking-in means performing image taking in according to the directions from said 3rd directions means.

[Claim 9] It is the hand scanning scanner characterized by detecting the specific notation with which said image taking-in means was displayed on said body in the hand scanning scanner given [of claims 1-7 / one] in a term, and starting / ending image taking in.

[Claim 10] In a hand scanning scanner given [of claims 1-9 / one] in a term said image taking-in means An image detection means to detect a two-dimensional image, and the optical-system image means of communication which transmits the image of said two-dimensional field to said image detection means are provided. An actuation means to operate said optical-system image means of communication so that the frequency component of the image detected by said image detection means may become the highest, The hand scanning scanner characterized by having further the 2nd operation means which calculates the distance to said two-dimensional field based on the focus location in said optical-system image means of communication in case said frequency component becomes the highest.

[Claim 11] In a hand scanning scanner given [of claims 1-9 / one] in a term said image taking-in means The 1st spot Mitsuteru gunner stage which irradiates the spot light which possesses an image detection means according

to claim 10 and an optical-system image means of communication, is prepared in said image detection means side, and crosses aslant the optical axis in said optical-system image means of communication, The hand scanning scanner characterized by having further the 3rd operation means which calculates the distance to said two-dimensional field based on the location where said spot light appeared in the image detected by said image detection means.

[Claim 12] The hand scanning scanner characterized by having further the 2nd spot Mitsuteru gunner stage which irradiates spot light to the center position of said two-dimensional field in a hand scanning scanner given [of claims 1-11 / one] in a term.

[Claim 13] It is the hand scanning scanner characterized by providing a lighting means by which said image taking-in means carries out short-time lighting of said two-dimensional field with a predetermined time interval in a hand scanning scanner given [of claims 1-12 / one] in a term, and an image detection means to detect the image of said two-dimensional field by making said short time into the exposure time.

[Claim 14] It is the hand scanning scanner characterized by for said transmitting means being a transmitting means to transmit said information with infrared radiation, in a hand scanning scanner according to claim 13, and said lighting means illuminating said two-dimensional field with the infrared radiation obtained from the light source of said infrared radiation.

[Claim 15] It is the hand scanning scanner which has further the transparent body which possesses the opening edge which desires said two-dimensional field in a hand scanning scanner given [of claims 1-14 / one] in a term, and is characterized by said image taking-in means capturing the image desired from said opening edge.

DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Field of the Invention] This invention relates to the hand scanning scanner which reads the information displayed on bodies, such as printed matter.

[0002]

[Description of the Prior Art] The information displayed on printed matter, various goods, etc. by the manual scan is read, and there are a bar code reader of the Penn mold, a wand reader possessing a mechanical roller and a linear image sensor, etc. as conventional equipment outputted to a predetermined processing unit etc. The bar code reader of the Penn mold carrying out the manual scan of the bar code by the point, by detecting the reflected light of the light irradiated from the light emitting device by the photo detector, it reads the information expressed with the number and size of a bar code, and is widely used for the sales management of goods etc. Moreover, a wand reader makes a roller contact the front face of the body with which information, such as an alphabetic character, was displayed, and it acquires the information which carries out the sequential acquisition of the Rhine image perpendicular to a hand scanning direction with the linear image sensor, and was displayed from the image of the acquired scan field, carrying out a manual scan in the hand of cut.

[0003]

[Problem(s) to be Solved by the Invention] By the way, information, such as an alphabetic character displayed on printed matter etc., does not necessarily follow a fixed format, and has what was displayed in columnar writing, the thing displayed by lateral writing. On the other hand, since [the above-mentioned conventional wand reader] the image corresponding to hand scanning direction each location is obtained one

by one by capturing a vertical-lines image to the timing accompanying fixed roller rotation, it can be scanned only to the hand of cut of a roller. Therefore, in the conventional wand reader, the scanning direction was restricted, it had to be operated by having had in detail and having changed so that the hand of cut of a roller might suit the display gestalt of text, and it had the trouble that actuation was complicated and convenience was missing.

[0004] Furthermore, the above-mentioned wand reader must be pressing and using the tip for the space of the printed matter with which text was displayed etc. from the structure of rotating a roller. For this reason, in the conventional wand reader, a point could not scan text in the condition of having separated from space etc., and, naturally contacting the location distant from a user's hand and a point was not able to scan the information displayed on the front face of the body which is not suitable etc., either.

[0005] On the other hand, since it is the single dimension-type reader which reads only 1 crossing Rhine of a bar code, if the above-mentioned conventional bar code reader has dirt etc. in a part of bar code, it may be unable to read information correctly. For this reason, since the manual scan was repeated several times until it scanned crossing Rhine without dirt etc., also when information reading by the equipment which should be quick became rather troublesome, it was.

[0006] moreover, in the conventional hand scanning information reader which was mentioned above, since the main unit which should supply the read information was decided in many cases, it usually came out by the main unit, a cable, etc. concerned for it to be used, connecting or to be designed only for the main units concerned. For this reason, in the former, a reader was not able to be carried suitably and it was not able to be freely used as an information input means against various

equipments. For example, although the text of the homepage address carried by printed matter was not the information used only with equipment of 1 like the above-mentioned main unit but the information which can be used at each terminal, it carried suitably in the former and did not have the convenient information input means which was rich in the flexibility which can read and input such text in the location of each terminal.

[0007] It aims at offering the hand scanning scanner which can enable this invention to also scan the information displayed on the location which was made in view of such a situation, and raised the degree of freedom of the scanning direction, and was left, and can raise the convenience of actuation.

[0008] Furthermore, this invention can be carried easily, can read information in a desired location, can input it into other equipments, and aims at offering the hand scanning scanner which can be greatly contributed to a user's facilities.

[0009] In addition, even if this invention has partial dirt etc. in a bar code, it aims at offering the hand scanning scanner which can read information correctly.

[0010]

[Means for Solving the Problem] In the hand scanning scanner which reads the information as which invention according to claim 1 was displayed on the body by manual scan The image taking-in means incorporated one by one per predetermined two-dimensional field moved to a manual scan with the two-dimensional image which follows an objective hand scanning direction, It is characterized by having an image composition means to compound each image of said two-dimensional field captured by said image taking-in means, and to reproduce said two-dimensional image of the range which carried out the

manual scan, and a transmitting means to transmit the information according to the playback image compounded by said image composition means to the exterior.

[0011] It is characterized by invention according to claim 2 capturing two or more Rhine images which said image taking-in means left to said hand scanning direction as an image of said two-dimensional field in a hand scanning scanner according to claim 1.

[0012] Invention according to claim 3 is characterized by for said image composition means comparing the Rhine image perpendicular to the hand scanning direction of each of said incorporated images, and carrying out sequential junction of the image part newly incorporated by migration of said two-dimensional field based on the location of the Rhine image in agreement, and compounding said playback image in the hand scanning scanner according to claim 1 or 2.

[0013] Invention according to claim 4 is characterized by having further the 1st operation means which calculates the movement magnitude of said two-dimensional field based on the location of said Rhine in agreement in the hand scanning scanner according to claim 3.

[0014] Invention according to claim 5 recognizes said playback image in a hand scanning scanner given [of claims 1-4 / one] in a term, and has further a recognition means to generate the predetermined code information corresponding to said playback image, and said transmitting means is characterized by transmitting the code information generated with said recognition means.

[0015] Invention according to claim 6 has further a display means to display said playback image, and the 1st directions means which directs informational transmission in a hand scanning scanner given [of claims 1-5 / one] in a term, and said transmitting means is characterized by performing transmission, when directions are received from said 1st

directions means.

[0016] Invention according to claim 7 has further the 2nd directions means which directs informational un-transmitting in a hand scanning scanner according to claim 6, said display means clears an image on display, when directions are received from said 2nd directions means, and said transmitting means is characterized by to cancel the information which should be transmitted, when directions receive from said 2nd directions means.

[0017] Invention according to claim 8 has further the 3rd directions means which directs taking in of said two-dimensional image in a hand scanning scanner given [of claims 1-7 / one] in a term, and said image taking-in means is characterized by performing image taking in according to the directions from said 3rd directions means.

[0018] Invention according to claim 9 is characterized by for said image taking-in means detecting the specific notation displayed on said body, and starting / ending image taking in in the hand scanning scanner given [of claims 1-7 / one] in a term.

[0019] Invention according to claim 10 is set on a hand scanning scanner given [of claims 1-9 / one] in a term. Said image taking-in means An image detection means to detect a two-dimensional image, and the optical-system image means of communication which transmits the image of said two-dimensional field to said image detection means are provided. An actuation means to operate said optical-system image means of communication so that the frequency component of the image detected by said image detection means may become the highest, It is characterized by having further the 2nd operation means which calculates the distance to said two-dimensional field based on the focus location in said optical-system image means of communication in case said frequency component becomes the highest.

[0020] Invention according to claim 11 is set on a hand scanning scanner given [of claims 1-9 / one] in a term. Said image taking-in means The 1st spot Mitsuteru gunner stage which irradiates the spot light which possesses an image detection means according to claim 10 and an optical-system image means of communication, is prepared in said image detection means side, and crosses aslant the optical axis in said optical-system image means of communication, It is characterized by having further the 3rd operation means which calculates the distance to said two-dimensional field based on the location where said spot light appeared in the image detected by said image detection means.

[0021] Invention according to claim 12 is characterized by having further the 2nd spot Mitsuteru gunner stage which irradiates spot light to the center position of said two-dimensional field in the hand scanning scanner given [of claims 1-11 / one] in a term.

[0022] Invention according to claim 13 is characterized by said image taking-in means possessing the lighting means which carries out short-time lighting of said two-dimensional field with a predetermined time interval, and an image detection means to detect the image of said two-dimensional field by making said short time into the exposure time in the hand scanning scanner given [of claims 1-12 / one] in a term.

[0023] Invention according to claim 14 is a transmitting means by which said transmitting means transmits said information with infrared radiation, in a hand scanning scanner according to claim 13, and said lighting means is characterized by illuminating said two-dimensional field with the infrared radiation obtained from the light source of said infrared radiation.

[0024] Invention according to claim 15 has further the transparent body which possesses the opening edge which desires said two-dimensional field in a hand scanning scanner given [of claims 1-14 / one] in a term,

and said image taking-in means is characterized by capturing the image desired from said opening edge.

[0025]

[Embodiment of the Invention] The gestalt of operation of this invention is explained to below <a basic configuration and its actuation> with reference to a drawing. Drawing 1 is drawing showing the configuration of the Penn mold character recognition scanner by 1 operation gestalt of this invention.

[0026] In this drawing, 1 is a hollow cylinder-like barrel which makes the appearance principal part of this Penn mold character recognition scanner, and has a dimension of extent which can be grasped single hand like Penn. 2 is the area pellucida attached in the tip side of a barrel 1, and consists of a barrel 1 and the transparent body of the form which cut off the end of the hollow cylinder of this thickness aslant mostly. This Penn mold character recognition scanner is used towards the body with which the information on printed matter etc. was displayed like illustration of the opening edge where this area pellucida 2 inclined, and the tilt angle of this opening edge serves as a predetermined include angle which is easy to turn this opening edge to a body side, and becomes, when this Penn mold character recognition scanner is held so that a user may have Penn.

[0027] 3 is the light source for lighting which consisted of LED etc., is prepared near the attachment section (attachment section with the longer side attachment wall of the area pellucida 2) to the barrel 1 of the area pellucida 2, and illuminates above-mentioned opening one end with a suitable time interval. 4 is the optical-system lens prepared in the barrel 1 interior, and carries out image formation of the two-dimensional image of the fixed field desired from the above-mentioned opening edge to the reverse sense in the two-dimensional image sensors 5 (refer to

the void arrow head in drawing.). It becomes the scan field which reads the text (image) which said fixed field is a field in the lighting field illuminated by the light source 3 for lighting, and was displayed here. Moreover, the focus device which enables migration to the longitudinal direction of a barrel 1 is installed in the optical-system lens 4 (illustration abbreviation), and the focus at the time of carrying out image formation of the image to the location of the two-dimensional image sensors 5 can be performed now.

[0028] The two-dimensional image sensors 5 consist of CCD which detects the two-dimensional image of the scan field by which image formation was carried out through the optical-system lens 4 with the above-mentioned time interval, and changes it into an electrical signal, and initiation/termination of image incorporation are controlled by the switch 6, and they supply the captured image to the latter image composition section 7 one by one. Although the two-dimensional image sensors 5 set up beforehand the time interval (namely, time interval of each lighting exposure actuation of the light source 3 for lighting) which captures an image in consideration of the speed of a manual scan etc. here, it is not necessary to be an especially fixed time interval (after-mentioned). Moreover, these two-dimensional image sensors 5 incline within a barrel 1 according to the tilt angle of the above-mentioned opening edge, and the image of a scan field is projected on that image detection side without distortion etc.

[0029] Since [this Penn mold character recognition scanner] the image of a scan field is captured with the two-dimensional image sensors 5 through the optical-system lens 4 in this way, it does not need to make the above-mentioned opening edge contact the body with which the information on printed matter etc. was displayed at the time of use. Namely, this Penn mold character recognition scanner cannot possess a

mechanical roller etc., and can also scan the image of the distant location now.

[0030] A switch 6 is a switch which directs initiation/termination of a scan, is formed in the side attachment wall of a barrel 1, and outputs the indication signal of initiation/termination of a lighting exposure and image incorporation to the light source 3 for lighting, and the two-dimensional image sensors 5 according to actuation of a user. It designs carrying out the directions by this switch 6 like termination, if initiation and it will be released once it is pressed, or carrying out them like [when are pressed once and it is pressed again initiation and after that] termination etc. in the gestalt which is easy to operate it suitably according to the location of a switch 6 etc.

[0031] The image composition section 7 consists of predetermined operation part, the predetermined storage section, etc., compounds the image of the scan field by which sequential supply was carried out from the two-dimensional image sensors 5, and supplies the compound image to the character recognition section 8. In addition, about the detail of the image composition processing by this image composition section 7, it mentions later.

[0032] The character recognition section 8 analyzes the synthetic image supplied from the image composition section 7, and the recognition character representation section 9 and the infrared transmitting section 10 pass through the character code corresponding to the recognized alphabetic character, respectively, and it outputs it while it recognizes the alphabetic character displayed on the scanned range. The recognition character representation section 9 is a display means which consists of a display device, its drive circuits, etc., such as liquid crystal. That screen is exposed to the lateral surface of a barrel 1, and this recognition character representation section 9 displays the alphabetic

character corresponding to the character code received from the character recognition section 8 on this screen.

[0033] The infrared transmitting section 10 is attached in the back end of a barrel 1, is a transmitting means to transmit the character code received from the character recognition section 8 to other terminal units etc. with infrared radiation, and operates according to the indication signal from switches 11 and 12. A switch 11 is a switch for performing transmitting directions of a character code, and if pressed, it will output the indication signal to the infrared transmitting section 10. A switch 12 is a switch for performing a transmitting termination and clear directions of a character code, and if pressed, it will output the indication signal to the infrared transmitting section 10 and the recognition character representation section 9.

[0034] That is, this Penn mold character recognition scanner serves as a character reader of communications department one apparatus which the part equivalent to the scanning equipment which reads and recognizes information, and a means to transmit the information to the exterior unified, and shortly after a switch 11 is pressed, the infrared transmitting section 10 transmits the character code received from the character recognition section 8 with the modulated infrared signal. On the other hand, if a switch 12 is pressed, the infrared transmitting section 10 will clear this, without transmitting the character code received from the character recognition section 8, and the recognition character representation section 9 will clear an alphabetic character on display.

[0035] Next, actuation by the above-mentioned configuration is explained. Here, it explains by making into an example the case where read the character string "ABC" shown in drawing 2 (a), and it transmits. In addition, the field shown with a square expresses the scan field

scanned by one image incorporation by the two-dimensional image sensors 5 among drawing 2 (a), and the thick wire arrow head expresses the scanning direction to which the opening edge of the area pellucida 2 is moved by manual scan.

[0036] First, an opening edge is moved from the head of a character string to the back end, a user turning the opening edge of the area pellucida 2 to the direction of a character string, and operating a switch 6. What is necessary is just not to press the opening edge of the area pellucida 2 against a character string, and to only turn it to the direction of a character string at this time.

[0037] Thereby, the two-dimensional image sensors 5 capture the image of the scan field illuminated by the light source 3 for lighting one by one with a predetermined time interval, and supply it to the image composition section 7. The image by which sequential supply is carried out to the image composition section 7 at this time becomes a thing like image ** shown in the left-hand side of drawing 2 (b), image **, and image **.

[0038] Next, in the image composition section 7, the alphabetic character image displayed on the scanned range is compounded using the captured image of each scan field. Image composition here compares the vertical-lines image of the images of each scan field, and is performed by carrying out sequential junction of the image part newly incorporated with migration of a scan field.

[0039] For example, it looks for the vertical-lines image which is in agreement in the right end vertical-lines image of image ** as compared with each vertical-lines image and order of image **. In addition, although it may begin to compare from a high-order end or which [right end] thing about the vertical-lines image of image **, it is more efficient to compare with illustration extent from the thing of a high-order end by

the case where a scan field changes.

[0040] Here, supposing there is a vertical-lines image which is in agreement in image **, the vertical-lines image on the left of it will overlap image **, and right-hand side will be called the newly captured image when the scan field moved. Then, the image composition section 7 cancels the data of the vertical-lines image (vertical-lines image of the sign L1 neighborhood in drawing 2 (b)) which is [in image **] in agreement, and the vertical-lines image in the left-hand side, and joins the image in the right-hand side to the right end of image **.

[0041] On the other hand, like image **, when a right end vertical-lines image is blank, it looks for the vertical-lines image which is in agreement in the vertical-lines image of the high-order end of continuing image ** as compared with each vertical-lines image and order of image **. However, since the vertical-lines image on the left-hand side of image ** is already canceled as mentioned above, it compares here sequentially from the vertical-lines image of the right end of the image to which image ** and image ** were joined, or a high-order end. In addition, it is [which are a high-order end and the right end] better to make it begin to compare from a high-order end by case like illustration also in this case, although it may begin to compare either.

[0042] Here, supposing there is a vertical-lines image which is in agreement in the junction image of image ** and **, the vertical-lines image on the right of it will overlap image **. Moreover, about image **, it will be called the image by which right-hand side [part / the / duplication] was newly incorporated by migration of a scan field. then, the data of the vertical-lines image which has the image composition section 7 in the vertical-lines image (vertical-lines image of the sign L2 neighborhood in image ** of drawing 2 (b)) in agreement and its right-hand side in said junction image -- canceling -- the part -- image **

is joined to the image after canceling data. It means that the image part newly incorporated as a result was joined by this.

[0043] Thus, the image composition section 7 detects migration of a scan field by searching the vertical-lines image in agreement in the image of each scan field which changed, while it cancels one side of the image which is before and after migration and overlaps, performs image composition and generates synthetic image ** as shown in the right-hand side of drawing 2 (b) by joining the image newly captured after migration (playback). Then, this generated synthetic image is supplied to the character recognition section 8, and the character recognition section 8 recognizes the alphabetic character in the synthetic image concerned, and outputs the character code corresponding to each alphabetic character to the recognition character representation section 9 and the infrared transmitting section 10. Thereby, the character string corresponding to those character codes is first displayed on the recognition character representation section 9.

[0044] Next, a user checks whether it is in agreement with the character string which looked at and scanned the character string displayed on the character recognition display 9. A switch 11 will be pressed if the character string is in agreement at this time. Thereby, the character code corresponding to the character string is transmitted from the infrared transmitting section 10, and the text displayed on bodies, such as printed matter, is inputted into other terminal units etc. In addition, the receiver which receives the character code signal (infrared signal) from the infrared transmitting section 10 is beforehand formed in other terminal units (this receiver etc. is easy to be the same as that of what receives the signal of the usual infrared remote control.).

[0045] A switch 12 is pressed when it is a different thing from the character string which the displayed character string scanned on the

other hand. Thereby, the infrared transmitting section 10 clears a character code, without transmitting, and clears a character string while also displaying the recognition character representation section 9. In such a case, a manual scan is performed until a character string is scanned correctly, and the same actuation as the above is repeated.

[0046] Although the above is the fundamental configuration and actuation of the Penn mold character recognition scanner by 1 operation gestalt of this invention, there are various gestalten in the whole configuration mentioned above, actuation of each component, and a function besides the above. The example of the various gestalten is explained below.

[0047] Although the <example of gestalt of versatility, such as configuration and actuation,> (1) image composition processing above-mentioned image composition section 7 compared the vertical-lines images of each scan-field image, this is because the scanning direction in the above-mentioned gestalt of operation was horizontal. That is, when the scanning direction is perpendicular, image composition is performed by comparing the level Rhine images of each scan-field image, and joining an image on the basis of a level Rhine image in agreement. Thereby, the above-mentioned Penn mold character recognition scanner does not ask ** which is lateral writing as the character string to read is columnar writing, but it can be scanning it, had in the same direction.

[0048] In addition, in order to scan similarly both directions horizontal in this way and vertical Although it is desirable for the number of vertical-lines images and the number of level Rhine images of a scan field to be equal (that is, for the pixel of a scan field to have the shape of a matrix of $N \times N$), a horizontal chisel, Or respectively, if it scans only perpendicularly, if only a vertical-lines image and one level Rhine image

are captured, it is possible to perform image composition by the same Rhine image comparison as the above. However, since exact image compounding will become impossible if it does in this way, at least two or more Rhine images which separated to the hand scanning direction are captured (good also as also changing the configuration in the direction of two-dimensional image sensors into doing in this way, and changing processing of the image composition section 7 according to it).

[0049] Moreover, when there is a vertical-lines image of a null, although [the above-mentioned gestalt of operation] a vertical-lines image is changed, it is good also as making it not capture the Rhine image of a null beforehand, or restricting the number of incorporation of a continuous null Rhine image, and coping with it.

[0050] (2) From the location of the Rhine image which was in agreement by the image composition processing in the measurement function image composition section 7 of migration length, the migration length of a scan field is detectable. That is, since there is migration of a scan field by the vertical lines on the right of L1 in image ** while moving to image ** from image **, and it means that there had been migration of a scan field by the vertical lines on the left of L2 in image ** while moving from image ** to image **, migration length can be found if a part for the vertical lines is counted. Therefore, if it is preparing further the separate data-processing section which adds the function finding migration length in this way to the image composition section 7, or has this function, the curvimeter and ball which measure the block distance of a map will become possible [using it as an unnecessary mouse etc.], for example.

[0051] (3) The range measurement above-mentioned Penn mold character recognition scanner between scan fields does not need to make the opening edge of the area pellucida 2 able to contact the body with which the alphabetic character to scan was displayed, and can also

scan the image of a location which is distant from an opening edge. Then, it is good also as adding the function which measures the distance between scan fields (distance to the alphabetic character displayed on the body from the Penn mold character recognition scanner). This function is realizable as follows, for example.

[0052] (i) The frequency component of "image uses the highest thing in a focus location. The frequency operation part which calculates the frequency component of the image captured with the "two-dimensional image sensors 5, the control unit which operates the above-mentioned focus device according to the result of an operation of this frequency operation part, and the distance operation part which calculates the distance from the location of the optical-system lens 4 etc. to a scan field are prepared further. The opening edge of the area pellucida 2 is turned to the scan field made into the distance measuring object, a focus device is operated by the control unit so that the frequency component called for by frequency operation part may become the highest, and it is made for the frequency component of the image captured with the two-dimensional image sensors 5 to become the highest in such a configuration.

[0053] It asks for the location of the optical-system lens 4 with which the image (namely, image with which profiles, such as an alphabetic character, are caught most clearly) which has the thereby highest frequency component is obtained, and let the location be a focus location to the scan field concerned. And based on the location (for example, opening end face of the area pellucida 2) of a specific scan field beforehand determined as the focus location, and the focus location of the optical-system lens 4 to the specific scan field, the distance from the Penn mold character recognition scanner to the scan field concerned is measured by finding the distance from said specific

scan field to the scan field concerned by distance operation part.

[0054] (ii) "spot light is irradiated and is measured. The spot Mitsuteru gunner stage which irradiates the spot of the light which crosses aslant the optical axis (alternate long and short dash line in drawing 1) of the "two-dimensional image sensors 5, and the data-processing section which converts into distance the light-spot location of the spot light which appeared in the scan field made into the distance measuring object are prepared further.

[0055] That is, in the data-processing section, it detects where [of the scan field concerned] the irradiated light spot of spot light appears first, and the distance of the light spot and the optical axis in the scan field concerned is found. And the distance from the Penn mold character recognition scanner to the scan field concerned is measured by converting the found distance into the distance from said intersection to the scan field concerned based on the distance of the spot light and the optical axis in the image detection side of the two-dimensional image sensors 5, and the distance from this image detection side to the light spot of spot light and an optical axis. However, when based on this technique, it is necessary to make the depth of focus of optical system deep.

[0056] Thus, if it is having a distance measurement function between scan fields, it is detectable whether a tip (the above-mentioned opening edge), printed matter, etc. of the Penn mold character recognition scanner touch or it is separated. Therefore, when using as a digitizer the Penn mold character recognition scanner further equipped with this function, the signal of a pen rise / pen down is generated, and it can transmit.

[0057] (4) If the laser pointer used as the direction indicator rod of a scanning location etc. is added to the scanning position representation

above-mentioned Penn mold character recognition scanner, the degree of freedom of the distance between scan fields will become still higher. That is, although the above-mentioned Penn mold character recognition scanner can also scan the distant location, it provides further as a means to display the core of a scan field which left what is not based on projector distance like laser light, but can display a clear spot, and this displays only one point of the core of a scan field, as shown in drawing 3.

[0058] Thereby, actuation of a user is helped and the scan from the distant location becomes still easier so that the target scan field can be scanned rightly. For example, it becomes possible to read in the distant viewing-and-listening location the character string displayed on the television screen etc.

[0059] Here, the thing of different wavelength is used in the light sources, such as laser light which displays this scanning location, and the above-mentioned light source 3 for lighting. It enables both sides to perform by this lighting by the light source 3 for lighting which must illuminate a scan field uniformly, and scanning position representation which shows only one based on scan fields by light. In addition, when light cannot be used, it is necessary to prepare the cursor of a special cross-joint mold etc.

[0060] (5) About the light source 3 for lighting lighting of a scan field, there is a following deformation gestalt besides relation with the above-mentioned scanning position representation.

[0061] (i) Infrared radiation is used for the lighting of "scan field. " -- it supposes that the infrared light source is used as the light source 3 for lighting, and the infrared light source (light source of the infrared transmitting section 10) used for a communication link is shared. Thereby, the light source can be saved.

[0062] (ii) If an input image moves into the exposure time to the image

detection side of the irradiation time two-dimensional image sensors 5, the phenomenon in which a detection image blurs will generate only the part of the distance which moved. Then, blurring of the image to capture is prevented by shortening enough 1 time of lighting irradiation time of the light source 3 for lighting. In this case, the time interval of each lighting exposure actuation of the light source 3 for lighting and the image taking-in time interval of the two-dimensional image sensors 5 are suitably adjusted according to a hand scan speed, and perform required sufficient image incorporation to the area of a scan field, and also hold down power consumption.

[0063] (6) Although the transmitting above-mentioned Penn mold character recognition scanner of an image character-code-ized the read alphabetic character image and it transmitted, you may make it transmit with an alphabetic character image. In this case, the both supply direct composition image also to the infrared transmitting section 10, and corresponding to that synthetic image infrared signal on which the synthetic image from the image composition section 7 is directly supplied to a display, and this is displayed is transmitted. If it does in this way, the character recognition section 8 will become unnecessary and it will become unnecessary to perform character recognition processing. However, a synthetic image is used as a character code, and actuation of the above-mentioned character recognition section 8 is switched suitably, and you may make it supply infrared transmitting section 10 grade, or supply infrared transmitting section 10 grade as it is if needed, without making it a character code.

[0064] Here, the scanned image itself can be transmitted directly, without being restricted to an alphabetic character, if it is when not performing character recognition processing. Thereby, within this Penn mold character recognition scanner, it becomes possible to perform

complicated processing which cannot be performed with other equipments, to use this Penn mold character recognition scanner as picture input devices, such as a graphic form, etc.

[0065] (7) Initiation/termination of initiation/termination scan of a scan are good also as judging by giving the specific notation to the bodies side, such as printed matter. That is, the scanning initiation mark and the scanning end mark which were beforehand defined before and after the character string displayed on printed matter etc. are attached, and by the image composition sections 7 (or image recognition section prepared still more nearly independently), those marks are recognized, and the image during a mark is recognized to be a character string, and is captured. In doing in this way, the above-mentioned switch 6 becomes unnecessary.

[0066] (8) Like the location above-mentioned Penn mold character recognition scanner of a switch, when directing initiation/termination of a scan, transmission / un-transmitting of a character code, etc. with a switch, change a location, a configuration, etc. of each switch suitably so that it may be easy to operate it. When the above-mentioned Penn mold character recognition scanner is held so that a user may have Penn, the above-mentioned switches 6, 11, and 12 operate a switch 6 by the index finger at the time of a scan, and transmission of a character code, or when clear, they are arranged so that easily [operating a switch 11 or 12 with the thumb].

[0067] In addition, since the Penn mold character recognition scanner mentioned above reads the two-dimensional image information displayed on the body, if it is used for bar code reading, it can be processed by taking into consideration the information on the die-length direction of each stripe of a bar code. Therefore, compared with the bar code reader of the conventional single dimension type, it becomes

possible to perform recognition strong against the partial dirt of a bar code.

[0068]

[Effect of the Invention] In the hand scanning scanner which reads the information displayed on the body according to this invention as explained above Since an objective two-dimensional image is captured one by one per two-dimensional field where it moves with a manual scan, the two-dimensional image of the range which compounded them and carried out the manual scan is reproduced and the information according to this is transmitted to the exterior The roller for detecting a motion of a hand scanning direction etc. becomes unnecessary, and information reading by the direction of arbitration can be performed from a body and the distant location. Thereby, while the degree of freedom of the scanning direction is raised, it becomes possible to also scan the information displayed on the distant location, and the effectiveness that the convenience of actuation improves sharply is acquired.

[0069] Moreover, since the hand scanning scanner itself shall perform information transmission outside, it can carry easily, information can be read in a desired location, it can also input into other equipments, and the effectiveness of contributing to a user's facilities greatly is acquired.

[0070] In addition, since information is read in an objective two-dimensional image, if it is used for bar code reading, it can process by taking into consideration the information on the die-length direction of each stripe of a bar code. Even if partial dirt etc. is in a bar code by this, the effectiveness that information can be read correctly is acquired.

[0071] Here, according to invention according to claim 2, an objective two-dimensional image is obtained by capturing two or more Rhine images which separated to the hand scanning direction as an image of said two-dimensional field.

[0072] And since [according to invention according to claim 3] sequential junction of the image part newly incorporated on the basis of the location whose Rhine image perpendicular to the hand scanning direction of each incorporated images corresponds is carried out, the playback image which eliminated the duplication image appropriately in consideration of migration of a two-dimensional field is compoundable.

[0073] In this case, since [according to invention according to claim 4] the movement magnitude of said two-dimensional field is calculated based on the location of Rhine in agreement, the equipment which uses movement magnitude as information, for example, the curvimeter and ball which measure the block distance of a map, becomes possible [also using a **** scanning scanner as an unnecessary mouse etc.].

[0074] Furthermore, since [according to invention according to claim 5] the code information which corresponds to recognize a playback image is transmitted, it is effective, when scanning the body with which the alphabetic character etc. was displayed and inputting the text into other terminal units etc. Moreover, if there is this when transmitting the information according to a playback image as it is, without performing recognition of a playback image etc., it means that it is possible to perform complicated processing which cannot be performed with other equipments, to use a **** scanning scanner as picture input devices, such as a graphic form, etc. inside a **** scanning scanner.

[0075] On the other hand, while displaying the playback image, since [according to invention according to claim 6] informational transmission is performed with the directions from the 1st directions means, it becomes possible to transmit, after checking whether information had been correctly read by display. And since [according to invention according to claim 7] the clearance of a display image and the informational (read information) cancellation which should transmit are

directed with the 2nd directions means, in addition when information is read accidentally, it can be coped with easily.

[0076] Moreover, since [according to invention according to claim 8] image incorporation is directed with the 3rd directions means, the specific notation which was displayed on the body according to invention according to claim 9 is detected and it opts for initiation/termination of image taking in, only what is in a desired hand scanning zone among the information displayed on the body can be read.

[0077] Furthermore, an optical-system image means of communication is operated so that the frequency component of the detection image in an image taking-in means may become the highest according to invention according to claim 10. Suppose that the distance to said two-dimensional field is calculated based on a focus location in case a frequency component becomes the highest, and according to invention according to claim 11 The spot light which crosses aslant the optical axis in an optical-system image means of communication is irradiated, and since the distance to said two-dimensional field is calculated based on the location where this appeared in the detection image, it is detectable whether the **** scanning scanner and the body touch or it is separated. Thereby, when using for example, a **** scanning scanner as a digitizer, it also becomes possible to generate the signal of a pen rise / pen down, and to make it transmit.

[0078] Moreover, since [according to invention according to claim 12] spot light is irradiated to the center position of said two-dimensional field, the target scan field can be scanned correctly rightly and the effectiveness that the scan from the distant location becomes still easier is acquired.

[0079] On the other hand, since [according to invention according to claim 13] short-time lighting of said two-dimensional field was carried

out with the predetermined time interval and the image of said two-dimensional field is captured in the short time, blurring of the taking-in image by said two-dimensional field moving by manual scan can be prevented. Since according to invention according to claim 14 information shall be transmitted for a transmitting means with infrared radiation and the light source of the infrared radiation is used also as the light source of lighting here, the light source for lighting and transmission can be saved.

[0080] In addition, since [according to invention according to claim 15] the image desired from the opening edge of the transparent body is captured, it becomes possible to save the quantity of light in the case of being able to scan, looking at the information displayed even if it made said opening edge approach a body through the transparent body, and performing the above-mentioned lighting etc.

DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]

[Drawing 1] It is drawing showing the configuration of the Penn mold character recognition scanner by 1 operation gestalt of this invention.

[Drawing 2] It is drawing showing the situation of the image composition processing in the image composition section 7.

[Drawing 3] It is drawing having shown the situation of scanning position representation in the lighting range of the light source 3 for lighting, and the scan field of the two-dimensional image sensors 5 repeatedly.

[Description of Notations]

1 Barrel

2 Area Pellucida

3 Light Source for Lighting

4 Optical-System Lens

5 Two-dimensional Image Sensors

6, 11, 12 Switch

7 Image Composition Section

8 Character Recognition Section

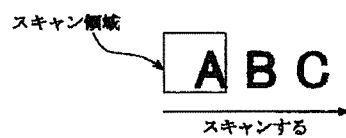
9 Recognition Character Representation Section

10 Infrared Transmitting Section

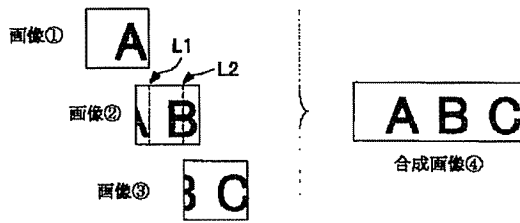
DRAWINGS

[Drawing 2]

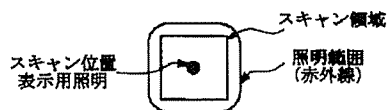
(a)



(b)



[Drawing 3]



スキャン位置

表示用照明

スキャン領域

照明範囲

(赤外線)

[Drawing 1]

